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SOURCE Stanki i instrument, No 12, 1949.

CONFERENCE PUSES SPARK GRINDING;  
NOTES NEW DRY-SPARK PROCESS

At the recent Moscow Conference on Metal Cutting, Ye. Ya. Ulitskiy and M. N. Ulitin discussed electrical methods of sharpening cutting tools, which make the use of abrasives unnecessary. According to VNII (All-Union Scientific-Research Institute for Cutting Tools) data, when sharpening on an electric unit at working voltages of 110-220 volts, the formation of an 0.2-millimeter defective surface layer is observed. This thickness varies with the work regime. The phenomenon is particularly noticeable when working under roughing regimes.

According to tests, the durability of cutters sharpened by the high-voltage electric-spark method is lowered 30-40 percent. After the cutters have been finished with boron carbide paste, this decrease in durability is not apparent. It has further been established that soft regimes (0.25-microfarad capacitance, 220 volts), which give a finish answering the precision of Class 7, GOST 2789-45, are very inefficient, the sharpening time being 20-30 minutes per cutter. The productive regimes, on the other hand, do not guarantee sufficiently high-quality edges.

M. N. Ulitin pointed out that the low-voltage electric spark sharpening unit ameliorates the indicated defects to a considerable extent. On this unit, the sharpening and finishing of one cutting edge of a cutter 16 x 20-20 x 30 millimeters, having an 0.7-millimeter back edge wear, takes 2 minutes if the cutter is of T15K6S hard alloy, and 1.5 minutes if the cutter is of VK8 hard alloy. Inspection of the structural changes in hard-alloy tools which have been worked by the low-voltage unit revealed no apparent micro-cracking, porosity or change in hardness. The durability of the tool is now lowered.

During the war years, so-called anode-mechanical grinding was suggested by V. N. Gusev and quickly found application at many plants. Thanks to this method, the necessity for using green carborundum abrasives dropped off. The process of anode-mechanical grinding of millers and cutter is similar to the process of abrasive grinding. In grinding a 16 x 25 millimeter cutter, 5-6 minutes are required; grinding a six-cutter miller of 200-millimeter diameter takes 40-60 minutes. This time can be cut 40-60 percent by the use of a special grinding attachment.

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Electric contact grinding is being used at some plants. It is a method which has only recently made its appearance. Its basic advantage is that the grinding is dry, that is, it is done without liquid media which, as is obvious, complicate the process. Power for the unit is supplied by an industrial-frequency alternating current through a step-down transformer. As a result there is no need for sources of direct current of rectifiers.

The conference appealed to the Ministry of Machine-Tool Building to get machine tools for diamondless grinding of hard-alloy tools into series production.

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